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ABSTRACT

The value of computer teleconferencing, which enables two or more individuals at two or more locations to communicate, is described. In short, computer teleconferencing brings the expert to the student at a time when the student has time to study, and a person can reenter the system at any time that work and home schedules permit. Once a basic knowledge has been achieved, computer teleconferencing is an ideal medium to discuss refinements or continuing education needs. Industries that utilize computer teleconferencing for business needs can also make educational classes available to employees. Unlike computer-assisted instruction, computer teleconferencing allows for genuine communication between instructor and the student. Additional advantages of this approach include the following: self-pacing means that the learner can organize the work for the most logical presentation and has time for reflection and review; instructions are clearer when written rather than spoken; learning independently increases the possibility for relaxed learning; students can communicate with one another; and improved project tracking becomes possible for both students and teachers. The use of computer teleconferencing for conferences and discussion is also discussed. (SW)

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LEARNING WITHOUT GOING THERE

EDUCATION VIA COMPUTER TELE/CONFERENCING

By Thomas B. Cross

"Writing is the more personal form of communication, the one which permits the most natural expression of feeling. The message, once detached can cross time and space, acquiring objectivity, permanence and mobility."

Andrew Feenberg

Western Behavioral Sciences Institute

U.S. DEPARTMENT OF EDUCATION
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Paper on computer tele/conferencing

Computer tele/conferencing is a system which enables two or more individuals at two or more locations to communicate. Without having to interrupt their work schedules and without having to pay for costly travel, these individuals can exchange information and learning aids. Through keyboard terminals, printers, and telephone lines, participants access a common computer for extremely efficient direct communication. The advantages of computer tele/conferencing are best stated in terms of its extraordinary flexibility: it overcomes geographical constraints (the necessity for travel either of the educator or the student) and time constraints (conflicting schedules, time zones). Computer tele/conferencing also brings expertise to people where it is not otherwise available. Computer tele/conferencing in short, brings the expert to the student, wherever that student may be located and whenever that student has time to study.

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The possibilities of computer tele/conferencing in the field of education are numerous. It has the potential to close the gap between the educational institution and the society it serves. It can rationalize the educational administrative process and facilitate educational planning. Most importantly, it can make available a superior education that utilizes top experts in each field for those who do not have the time or opportunity to travel to their local institution.

TEACHING OLD DOGS NEW TRICKS

Computer tele/conferencing enables a person to reenter the system any time he or she feels like it, despite work schedules, home schedules, and other commitments. In this manner, computer tele/conferencing closes the gap between learning and life, between the educational institution and the job market.

Today, the pattern of overeducated and underemployed (and, increasingly unemployed) is clear. Why has this state of affairs evolved? College and universities, despite the fact that they are major social institutions, often operate in a social vacuum. In some areas of the country, people with master's degrees in English cannot find jobs. While in other areas of the country illiteracy remains a deep problem. There are also large gaps in some professional fields, not enough job applicants with required skills. From another perspective, many corporations are choosing those states with a strong skilled labor force and the educational institutions to back that up.

Why computer tele/conferencing was chosen for a new medium of teaching was, "What is missing in education today is what has been termed education for work, training that is not simply the assimilation of a technical or business skill per se, but education that cultivates in the student the old-fashioned and time-honored ability to think. Towards this end the ideal courses could be, for example, an engineering course that is taught by an engineer and an English composition teacher, or a management course taught with a corporate manager and a systems theory expert in organizational sociology."

What computer tele/conferencing is not good for is basic skills training or initial hands-on training. If the student has never seen an automobile transmission, chemistry experiment, or what oil painting is, computer tele/conferencing is the wrong medium. How once a basic knowledge has been accumulated, computer tele/conferencing is an ideal medium to discuss refinements or continuing education needs. Computer tele/conferencing makes possible such multidisciplinary courses and programs. Diverse expertise on a given topic is available to the student. The computer tele/conferencing network becomes a 'electronic environment' in the thought processes of those connected to each other via the network. Teaching and learning become independent of time and travel restrictions, because busy experts can make effective contributions and give feedback to their student's course of study. Thus, with computer tele/conferencing, a course can be organized through the network rather than in person and taught by

the instructor in an asynchronous fashion, i.e., none of the teachers or students need be in the same place at the same time, yet they can be in touch at all times.

CONTINUING EDUCATION

Faced with the "knowledge explosion" of an "information-rich" society, education is increasingly and of necessity being viewed as a life-long process rather than a stage or period in an individual's life. Higher and higher costs of education both to the state and to the student are compelling a radical change in the educational system, one that allows for higher teacher-student ratios on one hand, and one that makes possible periods of schooling interspersed and interwoven with gainful employment on the other. Computer tele/conferencing makes expertise available to greater numbers of people who found cost a factor yet are interested in broadening their skills and perspectives, or starting over again in another field.

For those individuals bound by the demands and schedule of their current profession or family life, as is often the case of women with small children, computer tele/conferencing affords the opportunity to take advantage of leisure or nonbusy hours for continuing education.

One of the most innovative applications of computer tele/conferencing is being carried out at the Western Behavioral Sciences Institute in La Jolla, California. The WBSI School of Management and Strategic Studies is a two-year program that

incorporates a multi-media approach to the education of executives. Twice a year the participants gather in La Jolla for an intensive 8-day seminar, and the rest of the time they remain 'connected' to the program through print, audio tapes, telephone, and, as well as, computer tele/conferencing.

According to Mr. Darrell Icenogle, Director of Educational Resources at WBSI, "only about 40% of all business telephone calls are completed, and the percentage of completions for the kind of high-level executives we have in this (WBSI) program is of course much lower. With computer tele/conferencing, on the other hand, one has the confidence that a message sent is a message received. Also, communication of this kind tends to be less redundant, more precise, and less pressured. People communicate at their best because they have the time to say exactly what they mean to say."

Industries which utilize computer tele/conferencing for meetings, electronic mail, and other ongoing business needs can also make available to employees educational classes that will afford them the opportunity to advance their skills. Industry's need to reeducate employees and train new workers and staff can be accomplished easily with computer tele/conferencing without adding inhouse personnel or taking too much time away from ongoing duties of their training personnel. With computer tele/conferencing, no matter how many individuals are taking a course, basically the material needs to be taught only once. The company can use a combination of in-house managers and university instructors to teach

the classes. Such ongoing education and reeducation imparts to employees a sense of functional participation in a company, a broader perspective of the company's overall objectives, and the potential opportunities for advancement within it.

NOT COMPUTER-PROGRAM EDUCATION

For many years, computer-based education has failed to provide the personal and intimate instruction required by students. Computer tele/conferencing meets the challenge of individualized instruction. It provides an opportunity for self-motivated learning and makes it possible for each student to discern the best learning strategy. Computer-aided instruction (CAI) should not be confused with other computer-driven instructional systems. A clear distinction should be drawn, therefore, between computer tele/conferencing and CAI. CAI is programmed and packaged course material. The computer is programmed to respond to the student's actions. Computer tele/conferencing, on the other hand, allows for genuine communication between instructor and the pupil. With computer tele/conferencing, there is a constant back-and-forth dialogue with the teacher as well as other students, both online.

The following list capsulates some of the advantages of computer tele/conferencing in teaching and learning:

- o Instruction is individualized in terms of schedule, time methodology, teaching aids, texts, and tests. With individualized instruction, there arises the greatest opportunity to learn by insight rather than by rote, as there is less emphasis on or need for memorization.

o Working at one's own pace means there is improved ability to organize work for the most logical presentation. The discipline of putting thoughts into writing before communicating them improves the quality of communication.

o Instructions are clearer when written rather than spoken. Often two students can have different impressions altogether of what is being taught or asked by the instructor. Computer tele/conferencing eliminates such unnecessary confusion, thereby making both the teacher's job, such as grading the the student's task or writing a report, clearer and therefore easier and more efficient.

o Learning independently increases the possibility for relaxed learning. Instead of the usual competition for grades, custom learning creates a situation of less stress, and higher quality learning is the result. Exit the tyranny of the bell curve! Evaluation can be an ongoing process and can be carried out by peers as well as teachers. Each student has the means readily available for evaluating him/herself.

o Cooperation among students is greater. Students can discuss topics with other students taking the course and even with those who have already completed the course, i.e., there can be an ongoing file of previous students' work, contributions,

insights, etc. This translates to mean that all points of view can be exposed for comparative and critical analysis, resulting in richer feedback to the student. This also means that we can stop 'reinventing the wheel' and push on to solving more difficult and unknown problems. Team work can take place among students involved in a research project on the same topic.

o Improved project tracking becomes possible for both students and teachers. This allows everyone involved in the project to be informed from the beginning to the end. People can enter the process at any point and have full documentation to evaluate the process todate.

o Far from discouraging dialogue, a computer tele/conferencing system encourages users to put down ideas as they occur to them, and gives them time for reflection which might not be possible in a traditional classroom situation. With computer tele/conferencing, all students have equal time and equal access to speak before the group. Moreover, shy or inhibited students can feel easier about speaking before the audience.

o One of the greatest aspects of this technology is the ability for fully contemplated thought. In most real-time group activities, individuals must respond immediately with the answer or complete a task. In computer tele/conferencing environments, each person has the time to review the materials and requirements with the time to develop a more thought-out answer.

CONCLUSION

The aim of all education is to train students to assimilate their own new knowledge. Computer tele/conferencing achieves this goal better than the traditional teaching environment because it creates a new environment of motivation. It affords the opportunity for people to get more out of a course, take advantage of leisure time, continue their education, and reeducate themselves. Computer tele/conferencing thus provides the means for students to close the gap between their skills and the demands of the job market. With computer tele/conferencing the university moves out of the realm of ivory tower isolationism and into the society of which it should play a key role.

Likewise the university can through computer tele/conferencing can carry out educational planning and management to better meet the needs of those people who want to be on the cutting edge of the business and professional world. The university can also reach out for people to take courses from anywhere in the whole world. This will create new financial opportunities for universities with declining enrollments as they encourage students who want to <u>be there without going there</u>.

FIGURE ONE - REASONS FOR COMPUTER TELE/CONFERENCING

- NO TIME RESTRICTIONS - "NEVER LATE FOR CLASS AND NO MORE TELEPHONE TAG"
- NO GEOGRAPHICAL RESTRICTIONS - "ALWAYS THERE"
- LOWEST COST OF TELE/CONFERENCING TECHNOLOGIES
- SELF-DOCUMENTING AND FILING - "ELECTRONIC DESK"
- NO ACTORS OR PERFORMING SKILLS REQUIRED
- ALLOWS TIME FOR 'THOUGHT' IN WORK AND MANAGEMENT
- SELF-PACING AND TRAINING
- MULTIPLE PARTICIPATION IN MANY LECTURES IN A DAY

FIGURE TWO - COMPUTER TELE/CONFERENCING FEATURES

o Conference and Discussion Areas - Have you ever gone to a meeting with a colleague after which you left with entirely different impressions of what took place? Are meetings continually put off because one of the key players is out of town? A conference is the principal area which serves much like a book title. Within the conference there are 'dicussion areas' like the chapters in a book or lessons in a class. Writers use computer terminals to access text (data) files simultaneously by different persons located in many locations. This allows the group to share information in a central area, thus the concept of many-to-many communications with special areas for electronic meetings and discussions is created. These areas are accessed with approval of the conference manager much like a normal meeting. Discussions may be held on various topics, specific interests, and work activities.

o Personal 'yellow pad' notepads and files. Each writer has private secure (optional password protection) files or memo areas which are kept online for ease of use. These files perform the function of an electronic desk - file folders containing memos, plans, and correspondence. These notes or memos can be sent either to other conferees or to the discussion file.

o Online bulletin board - This is the electronic version of the hallway bulletin board. Ads, notes, notices can be posted to this area for system-wide access. Many electronic bulletin boards are used for employment postings, meeting announcements - job notices, company activities, policy and procedures, and a wide range of other bulletins.

o Status and tracking functions - Have you ever missed a staff meeting and wanted to know 'whats going on'? This function provides the conference member with information about what new comments have been sent to the conference, new mail, and information about 'keeping track of' project activities.

o Management reports and directories - Lets the conference member know about how long they have been working at an activity. This is useful to know for people who may be working at distant locations, for charge-back systems, or management reports. The directory is a useful system for finding out what conferences are on the system, conference members, or who else is interested in a conference on current topics such as quality control.

o Online Search Operations - Have you ever lost anything on your desk? Probably everyday. The capability of the computer system to perform functions far more rapidly than by hand helps find information quickly. Text searching of conference members, discussions, and personal notepad areas can save large amounts of time as well as allowing the conference members to be far better organized than in manual systems.

In addition, after the search is completed the results can be dispatched instantanously next door or around the world. Searching is generally performed by allowing the person to, for example, find comments on Venus and Mars but not Jupiter or Saturn. The computer will then retrieve the information requested and present the conference member with a listing of the occurences of these events. These can then be organized into a report or for personal filing.

o Online Voting/Polling/Testing - Reaching a consensus is never easy. Sometimes the group needs to make decisions before proceeding, then again at some point during the project, and then later evaluate what actually took place. Managers may need to determine proficiency for promotion or allowing use of certain machinery. Marketing research departments are increasingly examining employees to help determine corporate policy toward benefits, hiring practicies, or promotional requirements. This feature allows for secret, roll call (where the voters are known), true-false or multiple choice votes, polls, or tests.

o Gathering - Once you have a lot of information in separate file folders an important function is to reorganize it into a summary report. The 'gathering' function collects personal memos, mail, conference discussion comments and organizes them in any way you want them.

o Online 'Real-time' Meetings - while most computer conferences are actually performed in a non-real time environment, this features provides for an online conversation mode. The system knows who is presently 'on' the system and can help organize a conversational session like the telephone or face-to-face meetings except that the statements are made in text form. This feature is critically important in emergency situations, decision-making processes, or rapid information exchange as well as a verbatim transcript of the event.

AUTHOR

Thomas B. Cross is Managing Director of Cross Information Company of Boulder, Colorado. He teaches Office Information Systems at the University of Colorado and Trends in Information Technology in the graduate program at the University of Denver. He has authored over 30 articles on tele/conferencing, telecommunications, and information technology and is writing a book on tele/conferencing for Prentice-Hall. CIC developed MTX - Matrix Transaction Exchange an advanced computer tele/conferencing and electronic mail system - Winner of the Associated Information Managers - Outstanding Information Technology Award.